

1. A method for forming within a silicon semiconductor substrate employed within a microelectronics fabrication a silicon oxide dielectric layer comprising:
  - providing a silicon semiconductor substrate;
  - forming over the silicon semiconductor substrate a patterned silicon nitride mask layer;and
  - oxidizing the silicon semiconductor substrate locally at a first oxidation temperature of at least above 1100 degrees centigrade through the silicon nitride mask pattern to form silicon oxide dielectric layers.
2. The method of Claim 1 wherein by employing temperature of at least above 1100 to about 1200 degrees centigrade there is avoided formation of SiON impurities within the silicon oxide layer.
3. The method of Claim 1 wherein the silicon semiconductor substrate is formed from a material selected from the group consisting of:
  - single crystalline silicon material;
  - polycrystalline silicon material; and
  - amorphous silicon material.
4. The method of Claim 1 wherein the microelectronics fabrication is chosen from the group comprising:
  - integrated circuit microelectronics fabrications;
  - charge coupled device microelectronics fabrications;
  - solar cell microelectronics fabrications;
  - ceramic substrate microelectronics fabrications; and
  - flat panel display microelectronics fabrications.

5. The method of Claim 1 wherein the local thermal oxidation of silicon is performed in a dry environment comprising:

oxygen gas;  
nitrogen gas;  
average room temperature humidity.

(6) A method for forming within a silicon semiconductor substrate employed within an integrated circuit microelectronics fabrication a silicon oxide dielectric field oxide (FOX) isolation layer comprising:

providing a silicon semiconductor substrate;  
forming upon the silicon semiconductor substrate a silicon oxide pad oxide layer;  
forming upon the silicon oxide pad oxide layer a patterned silicon nitride mask layer;  
oxidizing the silicon substrate locally at a first temperature of at least above 1100 degrees centigrade through the patterned silicon nitride mask layer to form silicon oxide dielectric field oxide (FOX) isolation layers; and  
oxidizing the silicon substrate further at a second temperature no greater than 1100 degrees centigrade.

7. The method of Claim 6 wherein by employing a first thermal oxidation temperature of from at least 1100 to about 1200 degrees centigrade and subsequent thermal oxidation temperatures no greater than 1100 degrees centigrade there is avoided formation of impurity silicon oxynitride (SiON) phases in the silicon oxide layers.

8. The method of Claim 6 wherein the silicon oxide pad oxide layer is formed employing thermal oxidation of the silicon semiconductor substrate in an oxidizing environment.

9 . The method of Claim 6 wherein the semiconductor silicon substrate is a single crystalline silicon wafer of (100) crystal orientation.

10. The method of Claim 6 wherein the dry oxidizing environment comprises:

- oxygen gas;
- nitrogen gas;
- average room temperature humidity.